

REMARKS

The Final Office Action dated October 11, 2005, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto. The Applicants respectfully request reconsideration of this application in view of the foregoing amendment and the following remarks.

By the foregoing amendment, claims 1 and 5 have been amended. Thus, claims 1-6 are currently pending in the application and subject to examination. The amendments to claims 1 and 5 find support at least at page 16, lines 1 to 9 of the specification. The Applicants submit that no new matter has been added.

Rejection Under 35 U.S.C. § 112, first paragraph

Claims 1-6 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In making this rejection, the Office Action takes the position that the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. To the extent this rejection applies to the claims currently pending, Applicants traverse the rejection.

The Office Action takes the position that the requirement that the substrate bias is varied "continuously" is new matter, because the limitation could not be located in the specification as originally filed. Applicants respectfully disagree. Page 16, lines 22-24 of the specification disclose that "[i]n this case, the RF substrate bias supply power applied

during bias sputtering film forming was **continuously** varied with a desired electric power varied within the range between 0 and 350 W.” (emphasis added).

Applicants submit that the claim amendments made in the Amendment filed on August 31, 2005 draw support at least from the above-cited portion of the specification. As such, Applicants further submit that disclosure complies with the written description requirement, and respectfully request withdrawal of the rejection.

Rejection Under 35 U.S.C. § 102(b)

Claims 1-3 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Gopalraja et al. (U.S. Patent No. 6,193,855, hereinafter “Gopalraja”). To the extent this rejection applies to the claims currently pending, Applicants respectfully traverse the rejection.

Claim 1, as amended, recites a bias sputtering film forming process for forming a thin film by applying both voltages of a cathode voltage and a substrate bias voltage, where a thin film is formed on a substrate whereon an irregularity is formed in the state where only the cathode voltage out of both voltages is applied, and sputtering film forming is performed while continuously varying the substrate bias voltage so that the thickness of the thin film formed on the surfaces on the sidewalls and on the bottoms of the irregularity is substantially uniform, and the substrate bias voltage corresponds to a stored value in a database stored in a control system.

Applicants submit that Gopalraja fails to disclose or suggest all the elements of amended claim 1. Specifically, Gopalraja fails to disclose or suggest, “wherein said substrate bias voltage corresponds to a stored value in a database stored in a control

system." Gopalraja fails to disclose or suggest any type of database, or stored values of substrate bias voltage. In contrast, Gopalraja merely uses a microprocessor/controller 149 to transmit a signal to the signal generators 130, 132, and 134, which output the desired waveform to the target 104, the substrate support member 112, and the coil 122 (see Gopalraja, col. 6, lines 7-12). As the Office Action admits, "The substrate bias and the target bias are controlled by a controller" (see Office Action, page 3, numbered paragraph 8).

As such, Applicants submit that Gopalraja fails to disclose or suggest all the elements of amended claim 1.

Claim 5, as amended, recites a bias sputtering film forming apparatus, comprising an AC power source or a DC power source of variable output against substrate electrodes and a database stored in a control system, where the control system makes the cathode voltage set to a predetermined voltage previously, stores the substrate bias voltage value in the database when the substrate is apart from the target by a predetermined distance and the thickness distribution of thin films on each of the surfaces corresponding to the substrate bias voltage value as reference data, and controls the output of the power source such that it is continuously varied based on bias voltage functions produced by selecting the substrate bias voltage value from the database, that makes the film thickness substantially uniform from the reference data when each of the surfaces is formed.

Applicants submit that Gopalraja fails to disclose or suggest all the elements of amended claim 5. Specifically, Gopalraja fails to disclose or suggest at least

"continuously varied based on bias voltage functions produced by selecting the substrate bias voltage value from the database". As discussed above, Gopalraja does not mention a database, or selecting a substrate bias voltage value from the database, anywhere in its disclosure. As such, Applicants submit that Gopalraja fails to disclose or suggest all the elements of amended claim 5.

To qualify as prior art under 35 U.S.C. § 102(b), a single reference must teach, i.e., identically describe, each feature of a rejected claim. For the reasons provided above, Applicants respectfully submit that Gopalraja does not teach or suggest each and every feature recited by amended claims 1 and 5. Accordingly, amended claims 1 and 5 are not anticipated, nor rendered obvious in view of, Gopalraja.

As such, Applicants respectfully submit that independent claims 1 and 5 should be deemed allowable. As claims 1 and 5 are allowable, Applicants submit that claims 2 and 3, which depend from independent claim 1, and claim 6, which depends from independent claim 5, are likewise allowable for at least the same reasons as independent claims 1 and 5 are allowable, as well as for the additional subject matter recited therein.

Rejection Under 35 U.S.C. § 103(a)

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Gopalraja in view of Yamamoto (U.S. Patent Application Publication US 2002/0173144). Applicants respectfully traverse the rejection.

Claim 4 depends from independent claim 1. As such, all the limitations of independent claim 1 are incorporated by reference into dependent claim 4. Yamamoto is cited in the rejection of claim 4 for teaching that it is conventional to fill the recessed

portion of the trench or via with a metal film such as copper by electrolytic plating after a copper seed is deposited by sputtering, and when depositing the seed layer, it is conventional to use a substrate bias to improve the substrate coverage.

However, the Applicants respectfully note that Yamamoto fails to disclose or suggest at least the feature that “wherein said substrate bias voltage corresponds to a stored value in a database stored in a control system,” as set forth in amended claim 1. In other words, Yamamoto fails to overcome or otherwise address the deficiencies of Gopalraja with regards to claim 4.

As such, Applicants respectfully submit that dependent claim 4 be deemed allowable for at least the same reasons claim 1 is allowable, as well as for the additional subject matter recited therein.

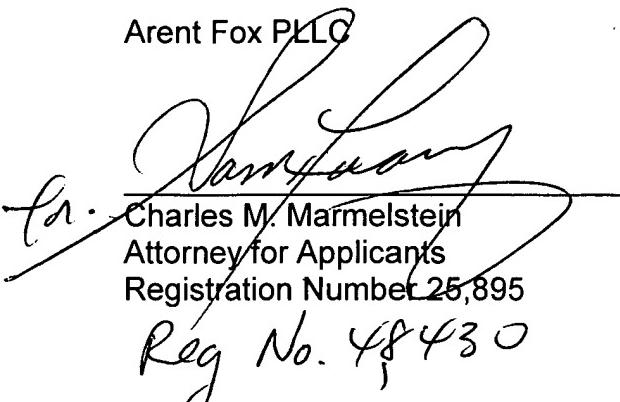
Conclusion

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not considered to be timely filed, an appropriate extension of time is requested. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account Number 01-2300, referencing Docket Number 101136-00095.

Respectfully submitted,

Arent Fox PLLC


Charles M. Marmelstein
Attorney for Applicants
Registration Number 25,895

Reg No. 48430

Customer Number 004372
AREN'T FOX PLLC
1050 Connecticut Avenue, NW
Suite 400
Washington, DC 20036-5339
Telephone: 202-857-6000
Fax: 202-857-6395

CMM/ SCO:vmh